

WHAT IS CLAIMED:

1. In an artificial limb for amputees who have a residual limb, the residual limb being encased in a liner, the residual limb and liner being inserted into the artificial limb socket, an apparatus for wicking away perspiration from the residual limb, the apparatus comprising: an osmotic membrane encasing the residual limb and lying between the residual limb and the liner, thereby creating a space between the residual limb and the liner, the membrane being adapted to allow the passage of water vapor in one direction only, from the residual limb towards the liner.

2. The apparatus of claim 1, further comprising:

a) a vacuum source connected to the space between the liner and the residual limb, wherein application of the vacuum source to the space between the liner and the residual limb lowers the partial water vapor pressure in the space, allowing water vapor to pass more readily through the osmotic membrane; and

b) a seal means for sealing the space.

3. The apparatus of claim 2, further comprising a means to maintain a vacuum in the space, in the presence of some air leakage past the seal means.

4. The apparatus of claim 2, wherein the seal means further comprises a nonfoamed, nonporous polyurethane suspension sleeve for rolling over and covering the socket and a portion of the residual limb.

5. The apparatus of claim 3, wherein the vacuum source is a vacuum pump and the means to maintain the vacuum in the cavity is a regulator, and further comprising a power source for the vacuum pump and the regulator.

6. The apparatus of claim 3, wherein the vacuum source and the means to maintain the vacuum in the cavity further comprise a weight-actuated vacuum pump.

7. A method of wicking away perspiration from a residual limb in an artificial limb, comprising the steps of:

a) inserting the residual limb into an osmotic membrane adapted to allow the passage of water vapor in only one direction away from the residual limb;

b) inserting the residual limb and osmotic membrane into a flexible liner wherein a space is created between the osmotic membrane and the liner;

b) inserting the residual limb and liner into a socket having a volume and shape to receive the residual limb and the liner, the socket having a cavity into which the residual limb and liner are inserted;

c) sealing the socket cavity;

d) applying a vacuum to the socket cavity between the liner and the socket, thereby drawing the residual limb and liner into firm and total contact with the socket; and

e) applying a vacuum to the space between the osmotic membrane and the liner.

8. The method of claim 7, further comprising the step of:

f) maintaining a vacuum in the socket cavity, in the presence of some air leakage into the socket cavity.

9. The method of claim 7, wherein the liner is of a non-foamed, non-porous polyurethane.

10. The method of claim 7, wherein a vacuum of at least ten inches of mercury is maintained in the cavity.